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EFFECT OF HERB MEDICINES FOR UROLITHIASIS ON URINARY OXALATE EXCRETION IN RATS

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The oxalate content in choreito and urocalun, both herb medicines, is minimal, and their contents of Ca, Mg, and P are also small. A rat experiment was performed to clarify their effect on oxalate excretion. They did not seem to have any adverse effect on urinary oxalate excretion. They had no diuretic effect and did not promote urinary oxalate excretion in rats. Therefore, they can be used in stone-formers for long periods.

Key words: Herb medicines, Choreito, Urocalun, Oxalate excretion

INTRODUCTION

Herb medicines have often been used for chronic diseases because of their slow, gradual, and steady effect. There are two herb medicines now available in Japan for the treatment of urolithiasis. Most urologists like to prescribe one of the two for stone-formers because of their minimal side effects and their gradual effect.¹⁾ However, they could have some adverse effect in the long run such as by increasing urinary oxalate excretion, because they are extracts and decocta of herbs. As tea is a kind of herb drink and contains a surprising amount of oxalate,²⁾ it is natural to suspect that oxalate is contained in those herbs and may affect urinary oxalate excretion.

Actually, however, their oxalate content was found to be very small, as determined by our oxalate assay; the contents of Ca, Mg, and P were also small. However, there are other possible factors to be studied which may alter oxalate excretion. In order to clarify the mode of oxalate excretion after the administration of these medicines, we have conducted a rat experiment by administering 10 times the usual dose of these medicines.

MATERIALS AND METHODS

Twenty male Wistar-strain rats (200 g)

were divided into 4 groups: control, choreito, urocalun, and allopurinol. Each group consisted of 5 rats. The rats in the latter 3 groups were administered 10 times the usual dose of each medicine, i.e., 140 mg/kg/day of the choreito extract (choreito group), 270 mg/kg/day of *Quercus stenophylla* Makino (urocalun group), and 20 mg/kg/day of allopurinol (allopurinol group). The medicines were divided into two portions and were administered through a feeding tube twice a day. 24-hour urine samples were collected in the 1st, 2nd, 3rd and 4th weeks. The urinary volume was recorded, and the oxalate was measured by the radioenzymatic method³⁾. The content of Ca, Mg, and P in the herb medicines was measured by ICP spectroscopy.²⁾ We acknowledge that the choreito extract was a gift from Tsumura-Juntendo, the urocalun extract (urajirogashi) was a gift from Nihon-Shinyaku, and the allopurinol was a gift from Tanabe, all pharmaceutical companies.

RESULTS

Choreito (1 g) and urocalun (1 tab) contained less than 1 mg of oxalate. Choreito (1 g) contained Ca 2 mg, Mg 0.7 mg, and P 1.5 mg. Urocalun (1 tab) contained Ca 0.7 mg, Mg 0.9 mg, and P 0.3 mg. Fig. 1 shows the urinary volume at the end of each week, while Fig. 2 shows the urinary

oxalate excretion. In the first week there were significant differences between the control-group and the allopurinol-group, between the allopurinol-group and the choreito-group, and between the allopurinol-group and the urocalun-group but there was no significant difference in the urinary oxalate excretion thereafter. Moreover, we observed no significant increase or decrease in urinary volume during the experimental period.

COMMENT

The diuretic effect of choreito and uro-

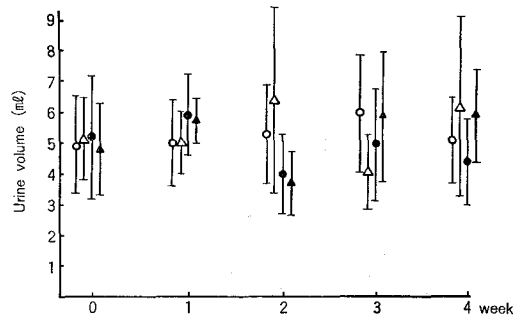


Fig. 1. 24-hour urine volume (mean \pm SD) in 4 groups: ○: control, △: allopurinol, ●: choreito, ▲: urocalun

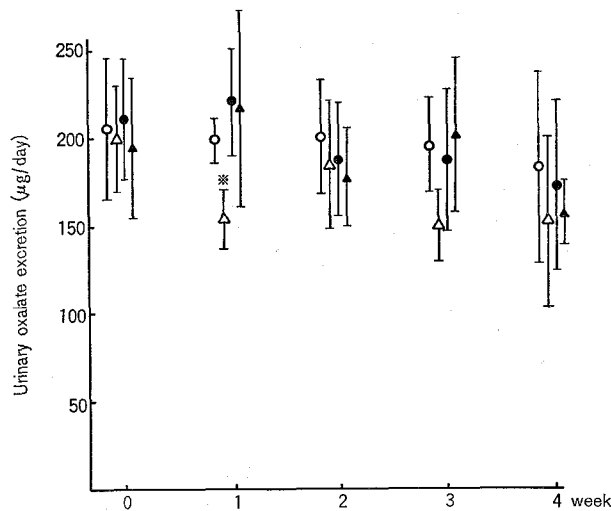


Fig. 2. 24-hour urine oxalate excretion (mean \pm SD) in 4 groups ○: control, △: allopurinol, ●: choreito, ▲: urocalun *a significant difference ($P < 0.01$)

calun has received some attention, and choreito has been reported by Aburada to have a diuretic effect at a low dosage.⁴⁾ In our experiment, however, no diuretic effect was observed. Urocalun has been reported to have no such effect;⁵⁾ this is compatible with our results. Unfortunately, there is not much basic data available concerning it, such as the effect on the urinary excretion of stone-forming constituents.

Dietary carbohydrates, vitamin C, and glycine have been studied as means to increase urinary oxalate excretion. Among common Japanese foods, high contents of oxalate have been found in spinach, choco-

late, peppers, sesame, and tea.²⁾ It is wise for stone-formers to avoid high-oxalate diets and also, if possible, foods and drugs which may increase urinary oxalate excretion. In our experiment, no effect of increasing urinary oxalate excretion in rats was observed.

Allopurinol was chosen as a negative control for the effect on urinary oxalate excretion. Some authors have reported that allopurinol decreases serum uric acid and also urinary oxalate excretion in humans.^{6,7)} We have, however, shown it to decrease urinary oxalate in the first experimental week, but not thereafter.

In conclusion, choreito and urocalun

were not found to have a diuretic effect, or to promote urinary oxalate excretion in rats. Therefore, it seems safe to say that these two herb medicines can be used in stone-formers for long periods.

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和文抄録

尿路結石治療 漢方薬のラットにおける尿中蓆酸排泄におよぼす効果

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小川 由英・高橋 茂喜・北川 龍一

尿路結石症に投与される漢方薬である猪苓湯およびウロカルン中に含まれる蓆酸量および Ca, Mg, P量はわれわれの分析の結果によると非常に少ないことがわかった。しかし、これらの漢方薬を投与することにより尿中蓆酸排泄量が増加するか否かは長期投与する場合重要な問題である。そこで、ラットにおいてアロ

プリノール投与群および対照群と比較して尿中蓆酸排泄量の増加は認められなかった。さらにこれらの漢方薬により利尿効果も認められなかった。われわれの実験結果により、これらの漢方薬は長期投与されても、尿中蓆酸排泄促進などの副作用は認められないと思われる。